Unit 3: Operations and Algebraic Thinking: The Properties of Multiplication and Division

In this unit students will engage in levelized problem-solving sets, games, and other visual/kinesthetic activities to develop and build meaning for the properties and operations of multiplication and division. In this unit, students will cement their facility with basic multiplication and division facts by modeling, representing, and explaining solutions as they explore contextual situations.
Important: Students should continue working with the array cards, 100 charts, and flashcards to learn multiplication and division facts. Remember if they know the multiplication fact, make sure they can say the corresponding division fact.
http://nces.ed.gov/nceskids/index.asp
MULTIPLICATION AND DIVISION ARE INVERSE OPERATIONS. THEY NEED TO BE TAUGHT TOGETHER AS STUDENTS EXPLORE ARRAYS AND WORK THROUGH THESE LESSONS.
When students discuss, help them use appropriate mathematical vocabulary as they explain and make observations. Use all problem types to help students develop understanding of how to use the operations of multiplication and division. Students need to discuss and compare strategies and models when explaining solutions. Models to use include: interlocking cubes, color tiles, hundreds charts, base 10 blocks, and number lines.
(The number line is a linear model to deepen students understanding of skip-counting, equal groups, and repeated addition. Skip count using numbers 2-10 compare the tools. Connect number line tool to 100 charts. How are they alike and different?)
Students need to use the array cards and skip-counting charts to learn their multiplication/division facts. This is the age when they are most interested! Embed commutative property, number theory, transformations, and vocabulary when working with cards. USE THESE ALL YEAR!!

In this unit, students will:
• apply properties of operations (commutative, associative, and distributive) as strategies to multiply and divide
• understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.
• fluently multiply and divide within 100, using strategies such as the patterns and relationships between multiplication and division
• understand multiplication and division as inverse operations
• solve problems and explain their processes of solving division problems that can also be represented as unknown factor multiplication problems.
• represent and interpret data

“Multiplication and division are commonly taught separately. However, it is very important to combine the two shortly after multiplication has been introduced. This will help the students to see the connection between the two.” (Van de Walle and Lovin, Teaching Student-Centered Mathematics 3-5, p. 60). Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: operation, multiply, divide, factor, product, quotient, strategies, and properties-rules about how numbers work.
*adapted from Georgia Department of Education